

APPENDIX A
CURRICULUM VITAE

ROBERT J. HAMMER

Years Experience 20

Technical Specialties

- Title V Operating Permits
- Prevention of Significant Deterioration and state and local air quality permitting
- Dispersion modeling
- EA/EIS studies
- Emission inventories
- Air pollution control studies
- Air quality and meteorology monitoring
- Property transfer assessments
- FERC studies and reports

Professional History

- Tetra Tech EM, Inc.
- ENSR Consulting and Engineering
- Institute of Atmospheric Science, South Dakota School of Mines and Technology
- Rockwell International, Rocky Flats Plant

Education

- MS (Meteorology) South Dakota School of Mines and Technology, 1988
- BS (Meteorology) Metropolitan State College, 1984

Professional Registrations and Affiliations

- Air and Waste Management Association

Representative Project Experience

Mr. Hammer's technical and regulatory work have included in-depth experience with U.S. Environmental Protection Agency (EPA) guideline analysis techniques as well as developing computer applications for nonroutine analysis such as hazard assessments and computer-based emission inventory routines and accident analysis routines.

Mr. Hammer has a thorough knowledge of commercial computer software as well as the FORTRAN computer programming language, which is the standard in air quality impact analysis. He has conducted computer graphics analysis and programming, including developing user friendly impact analysis routine software.

Various Environmental Projects. Conducted environmental studies efforts as a lead environmental professional while managing a variety of environmental projects. Other responsibilities include leading the technical studies group of the air resources division in the Denver office of Tetra Tech EM Inc. In this position he leads the air quality scientists responsible for air quality permitting and compliance. Responsibilities as a project manager frequently involves managing the work of other environmental professionals as well as overall project direction, organization, and administration.

Burlington Northern Railroad - Nemadji River Derailment. Air quality scientist performing emissions inventory and air impact analysis for a spill of aromatic concentrates of pyrolysis gasoline to the Nemadji River near Superior, Wisconsin. Analysis involved predicting emissions of the river slick and dispersion modeling of emissions in the immediate vicinity of the river and at nearby residences.

DGC Great Plains Synfuels Plant Air Quality Impact Analysis. Primary air quality meteorologist responsible for air quality impact analyses, including dispersion modeling, of emissions from DGC's Great Plains Synfuels Plant in North Dakota. Air quality impact analyses were conducted in support of numerous proposed configurations of the main stack from approximately 1988 through the most recent analyses in 1996. Configurations modeled involved evaluating various physical locations as well as operational parameters, including potential main-stack by-pass. Analyses included flares, building effects, simple and complex terrain, and visibility impact assessments.

DGC Great Plains Synfuels Plant Particulate Modeling. Completed an air quality dispersion modeling study of potential particulate matter emissions from the DGC Great Plains Synfuels Plant. The project involved an analysis of potential ambient air quality impacts and Prevention of Significant Deterioration (PSD) impacts from emissions at the Great Plains Synfuels Plant, neighboring sources at the Antelope Valley Station and the Freedom Mine, and at regional sources such as the Coyote, Leland Olds, Stanton and Coal Creek power plants.

DGC Great Plains Synfuels Plant CO2 Pipeline Risk Analysis. Analyzed risk associated with operation of the proposed CO2 pipeline that will transport CO2 from the Great Plains Synfuels Plant to oil fields in southern Saskatchewan. The risk assessment involved refining and executing a complex release and dispersion model and calculating the risk associated with potential accidental releases from the proposed pipeline. The release and dispersion model used a set of equations that Mr. Hammer transferred into Fortran code and further refined as part of this Tetra Tech project. Risk calculations were completed using a program also originally developed and written previously by Mr. Hammer and slightly modified by Tetra Tech for this project.

DGC Great Plains Synfuels Plant. Project manager and senior meteorologist for the analysis of accidental release of ammonia from the plant and the preparation of the 112r Risk Management Plan. Work involved the preparation of technical analyses, application forms, and public relations materials.

DGC Great Plains Synfuels Plant. Project manager for a project involving the execution of a dispersion modeling study of the impact of SO2 emissions changes associated with the Title V application for the facility.

DGC Great Plains Synfuels Plant. Senior meteorologist for a project involving the 112r compliant modeling and analysis of the potential release of ammonia from rail cars at the facility.

Northern Border Pipeline Co./ENRON - Natural Gas Pipeline Expansion/Extension Project. Staff meteorologist performing dispersion modeling and PSD permit application preparation for four individual compressor stations in Montana, North Dakota, South Dakota, and Minnesota.

Northern Border Pipeline Co. - Natural Gas Pipeline Expansion/Extension Project Northern Route. Meteorologist performing air quality studies for the environmental report leading to a FERC permit application for a 371-mile long, 36-inch diameter natural gas pipeline from Ventura, Iowa to Tuscola, Illinois.

Northern Border Pipeline Co. - Natural Gas Pipeline Expansion/Extension Project Southern Route. Meteorologist performing air quality studies for the resource reports to be submitted with a FERC permit application for a 373-mile long, 36-inch diameter natural gas pipeline from Ventura, Iowa to Tuscola, Illinois. Project also included evaluating the impacts of expanding or constructing eight compressors stations.

U.S. Department of Energy and Dakota Gasification Co. - Great Plains Coal Gasification Project. Air quality meteorologist responsible for dispersion modeling of emissions from the Great Plains synfuels plant in North Dakota. Analysis included industrial source, complex terrain, and visibility impact assessments.

Basin Electric Power Cooperative. Prepared minor construction and Title V Operating Permit applications for three sites with multiple natural gas turbines on a power generation project. The project involved phased permitting for quicker construction. We worked closely with the client to negotiate less stringent control and reporting requirements with the regulatory agencies. We also evaluated risk posed by formaldehyde and provided support for National Environmental Policy Act (NEPA) permitting. Tasks included preparing inventories of criteria pollutants and HAPs, development and use of an extensive regional inventory, New Source Performance Standards, feasibility studies of proposed sites, dispersion modeling with ISC3, and analysis of alternatives to meet best available control technology (BACT) requirements.

Basin Electric Power Cooperative. Conducted fatal flaw analyses of several potential sites for coal fired power plants. Project involved extensive development of regional air quality inventories and the dispersion modeling of numerous locations for a possible power plant.

Basin Electric Power Cooperative Toxic Release Inventory Support: Provided SARA 313 Toxic Release Inventory support for several midwestern utilities, including Basin Electric Power Company's Antelope Valley, Leland Olds, and Laramie River Stations. This work will involve inventorying of potential toxic emissions from these facilities and completing reporting requirements for pollutants and facilities that exceed applicable thresholds.

Basin Electric Power Cooperative, Leland Olds Station and Laramie River Station Impact Analyses: Managed and directed separate projects involving air quality impact analyses of potential emissions from Basin Electric Power Company's Leland Olds and Laramie River Stations. These analyses were conducted to determine potential air quality compliance associated with possible permit revisions.

Basin Electric Power Cooperative. Program Manager for the preparation of an Environmental Report for three proposed gas fired generating stations in Wyoming. The document was prepared to meet the NEPA requirements of the Rural Utilities Service.

Basin Electric Power Cooperative. Program Manager for the preparation of an Environmental Report for a proposed 24 mile long 230 kV power line in western South Dakota. The document was prepared to meet the NEPA requirements of the Rural Utilities Service.

Basin Electric Power Cooperative. Program Manager for the preparation of a Public Utilities Commission application for the construction of a proposed 24 mile long 230 kV power line in western South Dakota. The document was prepared to meet the statutory requirements of the State of South Dakota.

Basin Electric Power Cooperative. Program Manager for the preparation of an Environmental Evaluation for a proposed 75 mile long 230 kV power line in northeastern Wyoming. The document was prepared to meet the NEPA requirements of the Rural Utilities Service.

Basin Electric Power Cooperative. Program Manager for the preparation of a socioeconomics report, an industrial siting permit application, and socioeconomic impact mitigation and management plan for the potential siting of a coal fired power plant in northeastern Wyoming.

Montana Dakota Utilities. Conduct feasibility analyses and prepare PSD permit application for a coal fired power plant in southwest North Dakota. Work involves determining if there would be potential fatal flaws in the air permitting of the power plant and the full PSD permitting of the facility, including emission inventories, BACT analyses, near-field dispersion modeling, and evaluation of AQRVs, including extensive evaluations of visible emissions at Class I areas.

Montana Dakota Utilities - Heskett Station. Project Manager for study of air quality impacts on proposed fuel switching project for an electric generation station in Bismarck, North Dakota. The project included critical negotiations with State of North Dakota, EPA, and neighboring refinery. Critical issues involved PSD increment consumption from the power plant and a neighboring sources. Sophisticated impact analyses were involved to determine the contribution of various sources to PSD increment consumption and how the power plant could operate with an emissions bubble and maintain PSD increments or avoid significant impacts at predicted exceedences.

Years Experience: 27

Technical Specialties

- Design and Implementation of Air Quality Models
- Meteorological Analyses
- Permitting Studies
- Field Investigations
- Impact Analysis of Airborne Toxic Releases
- Expert Witness Testimony

Professional History

- ENSR Consulting and Engineering

EDUCATION

- M.S. (Meteorology) Massachusetts Institute of Technology
- B.S. (Atmospheric Science) State University of New York at Albany

PROFESSIONAL REGISTRATIONS AND AFFILIATIONS

- Certified Consulting Meteorologist
- Qualified Environmental Professional
- American Meteorological Society
- Air and Waste Management Association
- American Institute of Physics
- Am. Meteorological Soc.; Chair, Air Pollution Comm.1996-98
- Sigma Xi

REPRESENTATIVE PROJECT EXPERIENCE

Edison Mission Energy, Coal Fired Utility Station Upgrade, Homer City, PA. Managed Air Dispersion Modeling Studies to support a major upgrade to the Homer City Station recently aquired by EME from GPU. Upgrade included retrofit of wet scrubber to Unit 3, modifications to allow use of high sulfur coal, retrofit of SCR to Units 1, 2 and 3, steam turbine upgrades, new Unit 3 stack, and support facilities including scrubber effluent treatment. Project included a substantial emissions netting and regulatory applicability review, invoking the WEPCO Rule and Pollution Control Project exclusion. Permits have been issued, and the upgrade is currently under construction.

U.S. Generating Company. Resolved technical issues involving use of a nonguideline model in order to obtain an air permit for the Northampton, PA Generating Station.

New York State Electric & Gas. Principal investigator in compliance modeling of a coal-fired power plant near complex terrain. A critical modeling issue was use of on-site data for CTDMPPLUS.

American Petroleum Institute. Helped design, code, evaluate, and submit to EPA a modified industrial source complex (ISC) model incorporating the Scire-Schulman downwash algorithm; tested the model with data from special building downwash field experiments.

Electric Power Research Institute. Helped design, code, and evaluate a hybrid plume model (HPDM) for dispersion of emissions from power plant stacks, featuring a state-of-the art meteorological preprocessor. The study employed extensive aerometric and micrometeorological data from two sites.

AMS/EPA. Acting as an advisor to the American Meteorological Society and EPA in a working group (AERMIC) to update and replace the ISC model with a new model (AERMOD).

Illinois Power Company. Helped to develop a site-specific air quality dispersion model. Special emphasis was placed on stability estimates and vertical and horizontal dispersion coefficients with application of a monitoring and model evaluation protocol. The site-specific model was shown to be superior to the applicable EPA guideline model.

EPA. Submitted two air quality models (MPSDM and RTDM) to be included in the 1986 Guideline on Air Quality Models (Revised). Model user guides, computer code, and test cases were accepted by EPA. RTDM was adopted as a guideline model in 1988.

KIRK D. WINGES

Years Experience: 32

Technical Specialties

- Air Quality Model Development and Application
- Design and Implementation of Ambient Air Measurement Programs
- Modeling and Measurement
- Odor Science
- Air Quality Permit Application Preparation

Professional History

- MFG, Inc.
- TRC Environmental Corporation
- Earth Technology Company
- ERT, Inc.
- U.S. Air Force

Education

MS Chemical Engineering - University of California, Berkeley (1973)

BS Earth and Planetary Science - Massachusetts Institute of Technology (1971)

Professional Registrations and Affiliations

Air Pollution Control Association

Air and Waste Management Association - AWMA

Technical Association of the Pulp and Paper Industry

Representative Project Experience

Variety of source types throughout the U.S. and abroad. Conducted air quality investigations since 1970. Managed or directed over 200 major air quality studies. Conducted over 100 air quality modeling studies of a variety of industrial sources for particulate matter impacts, sulfur dioxide impacts, oxides of nitrogen impacts and other pollutants. Extensive experience with air permitting issues, and in particular with Title V and Prevention of Significant Deterioration (PSD) permits. He has prepared PSD permit applications for 15 different major industrial developments. Directed the preparation of five Title V permits and has taught a course on Title V permitting. Additional areas of extensive experience include fugitive dust evaluation and analysis of cooling tower plumes. Conducted impact analyses for over 40 major mining operations in the Western U. S. and Canada, and has developed two air quality models specifically designed for fugitive dust analysis. Retained as a technical expert on air quality issues by organizations such as the National Coal Association, the American Mining Congress, and the American Petroleum Institute.

Various industries including pulp mills, coal gasification plants, coal mines, smelters, oil shale developments, oil production facilities, aluminum reduction plants, copper mining and processing plants, geothermal developments, and coal-fired electric generation plants. Prepared numerous air quality permit applications. Projects have involved estimation of emission rates, air quality impact analyses with models and development of mitigation plans and control technology plans. He has prepared discussions of Best Available Control Technology (BACT) plans for industrial facilities and personally designed, constructed and tested a prototype scrubbing system for removing organic compounds from an industrial waste gas stack. Designed, installed, managed and directed

meteorological monitoring systems for numerous clients. Installed a network of three stations in Alaska, including a remote station on the North Slope of the Brooks Range.

Conducted several air quality studies for a large operating landfill in eastern Washington. The studies involved investigations of flare systems, fugitive dust and all air quality permits for a related gas-to-energy plant constructed at the landfill. Complex air quality modeling involving the CALPUFF system was included in the analysis. Prepared a Title V permit application for the same facility.

Provided air quality consulting to Boise Cascade for the St. Helens mill in Oregon. Air quality modeling to support a new air permit for the facility. Managed a meteorological monitoring program for the mill.

Evaluated visible plumes analysis for a large combined-cycle electricity generation facility near Bakersfield, California. Included in this effort was the application of the SACTI cooling tower model for the visual plumes from a system of 24 separate cooling towers at the plant. Also included in the effort was the development of a combustion stack visible plume model for evaluation of the visible plume dimensions for the turbine and HRSG exhaust plumes.

Evaluated cooling tower plumes; conducted a major investigation of visible plumes, plume shadowing, fogging/icing episodes, water deposition and salt deposition from a cooling tower system in western Washington. Developed a computer modeling system for cooling tower plume simulation and visualization. Mr. Winges is a licensed operator of the Electric Power Research Institute's SACTI cooling tower model.

Conducted several investigations of transportation related projects including an air quality evaluation of the entire street network for downtown Portland, Oregon. One area of special expertise is evaluation of air quality impacts related to vehicular tunnels, including the development of an air quality model to simulate impacts within a major freeway tunnel. Another area of expertise is the impact from diesel bus operation.

Conducted an extensive air quality modeling investigation for a major alumina production plant in Texas. Involved application of the Industrial Source Complex Model for over 300 separate sources of emission. Prepared a comprehensive air quality permit application for the entire facility.

Provided the air quality portions of an Environmental Impact Statement for the City of Seattle's Comprehensive Solid Waste Management Plan. The study involved evaluation of the complex odor issues surrounding the handling, and processing of solid waste.